

# Comparing the effects of material parameters on drapability using the VStitcher simulation program <sup>†</sup>

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**Abstract:** The mechanical deformation behavior of textiles, which can be divided into textile drape and drapability, plays a central role in the apparel industry. Both parameters influence the overall appearance, aesthetics and fit of garments. In garment simulation, this behavior must be reproduced as realistically as possible in order to provide a meaningful evaluation of design and construction. This study investigates and compares real and simulated textile fall. The drop coefficient serves as a numerical measure. Three cotton fabrics with different weave constructions, namely plain weave, twill weave and satin weave, are comprehensively investigated. In two experiments, the real textile drop according to Cusick and the simulated textile drop are determined using simulation program VStitcher simulation program. A subjective image comparison allows to evaluate the quality of simulation. By varying the material parameters step-by-step and comparing the images objectively, their influence on the simulation is analyzed. The results show that the bending in the VStitcher simulation program has the greatest influence on the virtual textile case and thus on the simulation result. However, caution is required when interpreting the VStitcher simulations due to possible deviations from the actual draping behavior, especially with regard to the anisotropy of the material. This study emphasizes once again that when manipulating the 3D representation by changing the material parameters, the simulated behavior of the fabric can deviate significantly from the real material behavior. This aspect must be taken into account in both fit analysis and optimization as well as in the generation of 3D images. In addition, standardized data acquisition methods and accessible simulation algorithms are essential to improve the understanding and adoption of simulation in the garment industry.

**Keywords:** drape parameter; draping; drape coefficient; Cusick drape test; fabric drape; garment drape simulation; 3D simulation; VStitcher; weave constructions; textiles; material parameters;

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